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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/762,805	02/13/2001	Peter G R Smith	124-838	9678

7590

08/08/2003

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EXAMINER

ZARROLI, MICHAEL C

ART UNIT

PAPER NUMBER

2839

DATE MAILED: 08/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n N .

09/762,805

Applicant(s)

SMITH ET AL.

Examiner

Michael C. Zarroli

Art Unit

2839

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 9-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. Some of the applicant's arguments, see Appeal Brief, filed 7/10/03, with respect to the rejection(s) of claim(s) 1 are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

- Between pages 1 and 2 of the specification, the applicant talks about "shortcomings" for direct bonding, but then doesn't indicate what these shortcomings are.

- What is direct bonding or direct interfacial bonding? In reading the specification, it appears that this (or these) bonding technique is merely the use of Van der Waals forces (electrostatic attraction).
- There appears to be translation problems in the specification.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

5. Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "direct interfacial bonding" in the claims is a relative term, which renders the claim indefinite. The term "direct interfacial bonding" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

- First, is there a difference between "direct bonding (DB)" and "direct interfacial bonding?"
- The examiner will interpret the term "direct interfacial bonding" as, the bonding between flat surfaces naturally caused by Van der Waals

forces that can be improved by techniques such as heating or using certain materials. The examiner does not give this technique a lot of weight as discussed later in this office action.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-3, 6-7 and, 9 (as best understood) are rejected under 35 U.S.C. 103(a) as being unpatentable over Booth et al in view of Beyea et al.

Booth discloses an optical waveguide (fig. 8) with a guiding lamina (1) of optical material (col. 5 line 28) bonded to a superstructure lamina (14) of optical material (col. 6 line 59). A second superstructure lamina (18) is also bonded to the guiding lamina. A light path (7) is defined by the guiding lamina. Booth also discloses modified (7) and unmodified optical regions (11) of the guiding lamina.

In regard to bonding the layers with direct interfacial bonding, the method of forming the device is a process limitation and not germane to the issue of

patentability of the device itself. Therefore, this limitation has not been given patentable weight. It is well settled that the presence of process limitations in product claims, which limitations do not otherwise distinguish the current article over the prior art, cannot impart patentability to that product. (*In re Johnson*, 157USPQ 670, 1968) also (*In re Thorpe*, 227USPQ 964, 1985). Applicant also states in the specification that direct interfacial bonding is well known in the art (second sentence), thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use any known bonding means such as direct interfacial bonding.

Booth does not disclose that the light guiding path is the unmodified region and that the modified region is the boundary of this path.

Beyea discloses an optical waveguide with superstructure lamina and, a light guiding path that is an unmodified region while the boundary of this light guiding path is the modified region (col. 5 lines 29-29-39).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to make the modified light path region of Booth an unmodified region bounded by modified regions. The motivation for this change would be to minimize certain types of defects e.g. dark line defects (Beyea, Field of Invention section).

Regarding claims 2 and 3, Booth in view of Beyea does not disclose the claimed materials recited in these claims. It would have been obvious to one having ordinary skill in the art at the time the invention was made to select a ferroelectric material or lithium niobate for the guiding lamina, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416. The motivation for these modifications would be that different materials are more applicable in certain environments. Also, different materials have different costs and availability.

Regarding claim 6 Booth discloses that the modified regions are formed by the “indiffusion” of dopant materials (col. 5 line 55).

Regarding claim 7 Beyea discloses that part of the modified region forms the light guiding path (fig. 1).

Regarding claim 9 Booth discloses a means for launching an input signal optical signal into the waveguide (fig. 12).

Response to Arguments

8. In regards to the applicant's argument that no reference was given, that discloses direct interfacial bonding between the guiding lamina and superstructure lamina, the examiner disagrees.

- The applicant very clearly says in the first page of the specification that this type of bonding is common in the art. In fact, the applicant says that this method of bonding is merely the use of Van der Waals forces; a physical force well known for decades. The examiner does cite a piece of prior art at the end of this office action, that does teach direct interfacial bonding.
- Process limitations are not given a lot of weight in apparatus claims.

9. In response to applicant's argument that the references fail to show direct interfacial bonding (DIB), it is noted that the features upon which applicant relies (i.e., page 8 of the Appeal Brief, benefits of DIB including of machining step) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims.

See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

10. In regards to the applicant's argument that no reasons for combining were provided, the examiner agrees and has provided a reason for combining the primary reference with the new teaching secondary reference.

Allowable Subject Matter

11. Claim 11 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

12. Claims 4-5, 10 and, 12 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

13. The following is a statement of reasons for the indication of allowable subject matter: The method of fabricating steps in claim 11 especially step 3, removing material from the guiding lamina. Also allowable the combination of claims 1 and 2 with electrically poled modified regions.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Molteni et al teaches direct interfacial bonding between lamina of an optical device.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael C. Zarroli whose telephone number is 703-305-0608. The examiner can normally be reached on 7:30 to 3:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne Feild can be reached on (703) 308-2710. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

16. **Any response to this action may be mailed to:**

**Commissioner for Patents
P.O. Box 1450
Alexandria, VA
22313-1450**

For additional information regarding this new address, which was effective May 1, 2003, see *Correspondence with the United States Patent and Trademark Office*, 68 Fed. Reg. 14332 (March 25, 2003).

Or faxed to:

703-308-7722 or 703-308-7724 (informal or draft communications should be clearly marked "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to:

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Crystal Plaza 4, Fourth Floor (Receptionist)
2201 South Clark Place, Arlington, Virginia.



Michael C. Zarroli
Examiner
Art Unit 2839

MCZ

MCZ

July 31, 2003